Two new *Tenthredo* species (Hymenoptera: Tenthredinidae) from China

Mengmeng LIU, Xiaotong WU, Wei XIAO, Meicai WEI[①]

Key Laboratory of Cultivation and Protection for Non-Wood Forest Trees, Central South University of Forestry and Technology, Ministry of Education, Changsha, Hunan 410004, China

Abstract: *Tenthredo bicuspis* Liu & Wei sp. nov. and *T. biminutidota* Liu & Wei sp. nov. are described from China. *Tenthredo bicuspis* is similar to *T. amurica* Dalla Torre, 1894 from Siberia in Russia but differs in the pterostigma yellow brown, the upper inner orbits, temple, pronotum, tegula, mesoscutellum and mesepisternum with distinct white maculae, the mesoscutellum strongly elevated with two obtuse peaks, the dorsum of head impunctate, the dorsum of thorax and mesopleuron shiny, the supraantennal tubercles strongly elevated with the posterior end abruptly cut off. *Tenthredo biminutidota* is similar to *T. flavobrunneus* Malaise, 1945 but differs in the postocellar area about 1.5 times as broad as long, the lateral furrows distinctly divergent backwards; the black macula on dorsum of head very large and almost touching the eye or nearly so, the supraantennal tubercles largely black and evenly merging with frontal walls; the mesoscutellum and mesepisternum not strongly elevated with a low peak; each abdominal tergite with a narrow basal black band and a pair of black dots laterally; the female hypopygium with a large middle process and serrulae hardly elevated.

Key words: Symphyta; Tenthredininae; taxonomy

中国叶蜂属二新种（膜翅目：叶蜂科）

柳萌萌，吴肖彤，肖炜，魏美才[①]

中南林业科技大学经济林培育和保护教育部重点实验室，湖南 长沙 410004

摘要：记述中国叶蜂科叶蜂属两新种：双峰白端叶蜂 *Tenthredo bicuspis* Liu & Wei sp. nov. 和双点光柄叶蜂 *T. biminutidota* Liu & Wei sp. nov.。双峰白端叶蜂 *T. bicuspis* 与 *T. amurica* Dalla Torre, 1894 近似，但翅痣黄褐色；内眶上半部及相连的上眶大斑、前胸背板后缘、翅基片、小盾片、中胸前侧片大斑、腹部第 1 背板全部黄白色；小盾片强烈隆起，顶部双突；头部背侧无刻点，胸部背侧和侧板具光泽；触角窝上突强烈隆起，后端突然中断，不与额脊连接等，与该种明显不同。双点光柄叶蜂 *T. biminutidota* 与 *T. flavobrunneus* Malaise, 1945 近似，但单眼后区宽长比约等于 1.5，侧沟向后明显分歧；头部背侧黑斑两侧接近或接触复眼内缘，触角窝上突大部黑色，后端与额脊间无凹陷；小盾片和中胸前侧片中部隆起度较低；腹部各节背板基部边缘黑色，背板两侧各具 1 对黑色点斑；雌虫下生殖板中突较大，锯腹片锯刃几乎不突出等，与该种不同。

关键词：广腰亚目；叶蜂亚科；分类

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① Corresponding author, E-mail: weimc@126.com

Introduction

Tenthredo Linnaeus, 1758 is the largest genus among the Symphyta in the order Hymenoptera. More than 1000 species have been described so far. Including the species described in this paper, about 310 *Tenthredo* species have been recorded from China (Wei *et al*. 2006; Hu & Wei 2013a, b; Shang & Wei 2013a, b; Liu & Wei 2013; Liu *et al*. 2013; Zhang & Wei 2013).

The diagnostic characters of *Tenthredo* L. are: the inner margins of eyes more strongly convergent in lower half; mandibles subsymmetrically tetradentate with a small basal lobe; occipital carina usually distinct and complete; the anal cell of forewing with a short and erect crossvein at about basal 1/4−1/3; the hind tibia clearly longer than hind femur; the hind basitarsus shorter than following 4 tarsomeres together; and the first abdominal tergite divided at middle into two lobes.

Material and methods

The specimens were examined with a Leica S8APO dissection microscope. Adult images were taken with a Nikon D700 digital camera and a series of images montaged using Helicon Focus (©HeliconSoft), while detail images were taken with Leica Z16 APO/DFC550. All images were further processed using Adobe Photoshop CS 6.0.

The terminology of sawfly genitalia follows Ross (1945) and that of general morphology follows Viitasaari (2002).

All types of these new species are deposited in the Insect Collection of the Central South University of Forestry and Technology, Changsha, Hunan, China (CSCS).

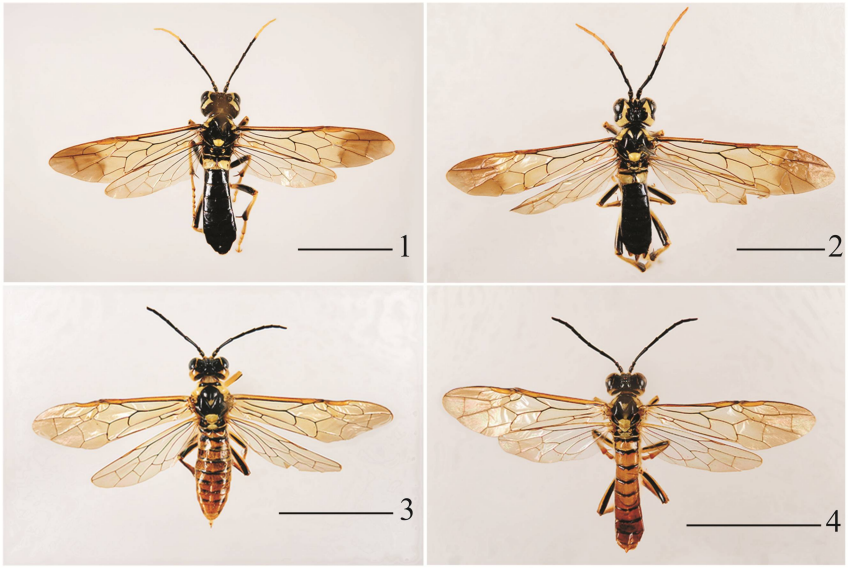
Taxonomy

1. ***Tenthredo bicuspis*** **Liu & Wei sp. nov.** (Figs. 1, 2, 5–21)

Description. Female (Fig. 1). Body length 17 mm. Body black, labrum, clypeus, mandible largely (Fig. 5), lower third of postorbit, hooked stripe on upper half of inner orbit and connecting transversal stripe on temple, spot on anterior of supraantennal tubercle (Fig. 6), apical half of 6th antennomere and 7th to 9th antennomeres entirely (Fig. 8), posterior corner of pronotum, tegula, stripe on lateral of prescutum, mesoscutellum, spot on posterior of cenchrus, anterior half of metapostnotum, large square macula on upper of mesepisternum (Fig. 10), metepisternum, 1st tergite largely shining yellow. Leg yellow, coxa largely, ventral and posterior of each femur, apical third of each tibia posteriorly black. Wings hyaline, apical third of forewing distinctly smoky, costa and pterostigma pale brown, other veins black brown (Fig. 1). Body hairs on dorsal side of head and of thorax brown, hairs on lateral and ventral side of body pale brown, setae on sheath black brown.

Head smooth, strongly shiny; apical half of labrum, basal half of mandible sparsely and largely punctured (Fig. 9), clypeus sparsely and shallowly punctured, postocellar area finely punctured, temple and inner orbit finely and obscurely punctured, middle of postorbit finely and densely punctured, lower fourth rugose and microsculptured. Dorsal of pronotum finely punctured, prescutum and scutum finely and densely punctured, surface smooth; anterior slope

of mesoscutellum finely and weakly punctured, posterior slope coarsely punctured, oily shiny, mesoscutellar appendage coarsely punctured, metascutellum indistinctly punctured; upper half of mesepisternum coarsely and shallowly punctured, surface smooth, peak of elevated area coarsely punctured, ventral half of mesepisternum finely and sparsely punctured, interspaces finely microsculptured, metepisternum finely and obscurely punctured. 1st tergite smooth, impunctate and without microsculpture, other tergites finely microsculptured.

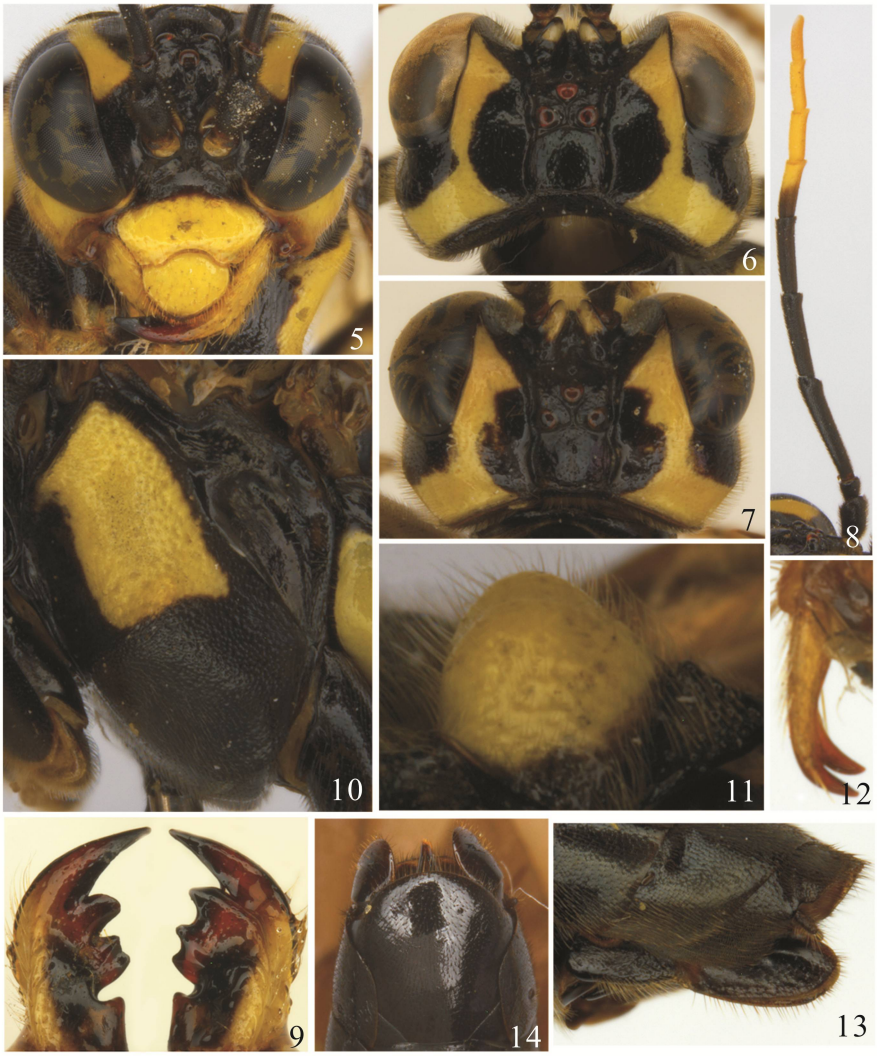


Figures 1–4. *Tenthredo* spp. Adults. 1, 2. *T. bicuspis*; 3, 4. *T. biminutidota*; 1, 3. Adult female, dorsal view; 2, 4. Adult male, dorsal view. Scale bars = 1 cm.

Clypeus flat, anterior incision about a quarter as long as clypeus; labrum broad and large, apex round; malar space about as long as diameter of ocellus; shortest distance between eyes about 0.73 times longest axis of eye (Fig. 5), supra-antennal tubercles distinctly elevated and divergent backwards, suddenly cut off and disconnecting with frontal walls, upper of inner orbit and temple flat; postocellar furrow distinct, interocellar furrow deep, POL : OOL : OCL = 10 : 33 : 27; postocellar area weakly elevated, broader than long as 37 : 30, lateral furrows deep, slightly curved and divergent backwards, occipital carina sharp and complete; head slightly dilated behind eyes in dorsal view, temple shorter than eye (18 : 21) (Fig. 6). Antenna as long as abdomen, slightly shorter than costal vein and stigma together, flagellum distinctly compressed, 3rd antennomere distinctly longer than 4th (30 : 23) (Fig. 8). Mesoscutellum distinctly elevated, with two obscure peaks in posterior view, without transversal or longitudinal carina (Fig. 11); mesoscutellar appendage with obtuse median ridge; median of mesepisternum distinctly elevated, with short transversal carina, without ventral spur (Fig. 10). Inner tibial spur of hind leg about 0.57 times metabasitarsus, metabasitarsus as long as following three tarsomeres together, tarsal pulvillus small. Claw with indistinct basal lobe, inner tooth distinctly shorter than outer tooth (Fig. 12). Hind anal cell sessile. Ovipositor sheath as long as metabasitarsus, apical sheath 1.3 times as long as basal sheath, setae on sheath very short (Fig. 13). Lance as in Fig. 15. Lancet with 19 serrulae, serrulae lobe-like,

strongly protruding, with 1 proximal and 2–3 distal subbasal teeth (Fig. 16), subbasal teeth minute, annular spine bands broadly merged (Fig. 17).

Male. Body length 17–18 mm (Fig. 2). Body color and structure similar to female except for: black stripes on femur smaller; subgenital plate as long as broad, apical margin round and obtuse (Fig. 14); harpe slightly longer than broad, apex round (Fig. 20); parapenis distinctly higher than broad (Figs. 19, 20); penis valve as in Fig. 21.



Figures 5–14. *Tenthredo bicuspis* Liu & Wei sp. nov. 5. Head of female, front view; 6. Head of female, dorsal view; 7. Head of male, dorsal view; 8. Antenna of female; 9. Mandibles; 10. Mesopleuron of female; 11. Mesoscutellum, lateral view; 12. Claw; 13. Ovipositor sheath, lateral view; 14. Subgenital plate.

Holotype. ♀, **China,** Hubei, Shennongjia, Hongping Town, 31°40.056′ N, 110°25.223′ E, alt. 1867 m, 17-VII-2009, Fu ZHAO. **Paratypes.** 3♀5♂, Hubei, Shennongjia, Hongping Town, 31°40.056′ N, 110°25.223′ E, alt. 1867 m, 16–17-VII-2009, Fu ZHAO & Zhao JIAO; 1♀,

Hubei, Shennongjia, Xiangxiyuan, 31°28.329′ N, 110°22.679′ E, alt. 1386 m, 11-VII-2008, Fu ZHAO; 1♂, Gansu, Hui County, Mayan Forestry Station, 17-VI-2007, Xingyu WU; 1♀, Gansu, Tianshui, Guanyin Forestry Station, 34°12.623′ N, 106°00.742′ E, alt. 1330 m, 10-VII-2009, Xun ZHU; 1♂, Shaanxi, Chang'an District, Jiwozi, 33°51.319′ N, 108°49.193′ E, alt. 1765 m, 27-VI-2008, Xiaoyu JIANG; 5♀, Hubei, Shennongjia District, Hongping Town, 31°40.016′ N, 110°25.025′ E, alt. 2500 m, 06-VIII-2015, Wei XIAO & Xing LV; 6♀3♂, Hubei, Shennongjia District, Honhuaduo Forestry Station, 31°43.029′ N, 110°29,018′ E, alt. 2000 m, 07-VIII-2015, Wei XIAO & Xing LV.

Figures 15–21. *Tenthredo bicuspis* Liu & Wei sp. nov. 15. Lance; 16. Lancet; 17. The 7th–9th serrulae; 18. Genitalia, dorsal view; 19. Genitalia, ventral view; 20. Gonoforceps, dorsal view; 21. Penis valve.

Etymology. This species epithet is named after the mesoscutellum having two peaks.

Distribution. China (Hubei, Shaanxi, Gansu).

Remarks. This new species is similar to *Tenthredo amurica* Dalla Torre, 1894 from Siberia, Russia but differs from the latter in the pterostigma yellow brown, the upper inner orbits and temple, pronotum, tegula, mesoscutellum and mesepisternum with distinct white maculae, the mesoscutellum strongly elevated with two obtuse peaks, the dorsum of head impunctate, the dorsum of thorax and mesopleuron shiny, the supraantennal tubercles strongly elevated with the posterior end cut off suddenly. In *Tenthredo amurica* the pterostigma black brown, the dorsum of head and thorax without white macula, the mesoscutellum weakly and roundly elevated without two peaks, the dorsum of head finely punctured, the dorsum of thorax and mesopleuron finely and densely punctured, feebly shiny, the supraantennal tubercles flat with the posterior end not cut off abruptly.

2. ***Tenthredo biminutidota*** **Liu & Wei sp. nov.** (Figs. 3, 4, 22–42)

Description. Female (Fig. 3). Body length 14mm. Head and antenna black, clypeus, labrum, mandible largely, palp, supraclypeal area, malar space, lower half of inner orbit entirely, narrow margin of upper inner orbit (Fig. 22), postorbit, lateral corner of temple (Fig. 23) and scape ventrally (Fig. 26) yellow; thorax yellowish brown, most transversal furrow of pronotum, prescutum except posterior fourth, scutum and parapsis black; dorsum of tergites and cercus brown, basal third of 1st tergite, basal narrow margin of other tergites black brown, each tergite with a pair of minute black dots laterally (Fig. 30); lateral fold of each tergite, sternum and ovipositor sheath yellow, apical margin of sheath dark brown. Leg yellowish brown, a short dorsal apical stripe on fore femur, a long dorsal stripe on middle femur, an entire dorsal stripe on hind femur, a linear stripe on dorsal posterior of fore and middle tibiae, hind tibia largely black. Wings hyaline, apical two fifths of forewing weakly infuscate, costa and pterostigma yellowish brown, other veins black brown (Fig. 3). Hairs on dorsal of head, thorax and mesoscutellum yellow, setae on sheath silver.

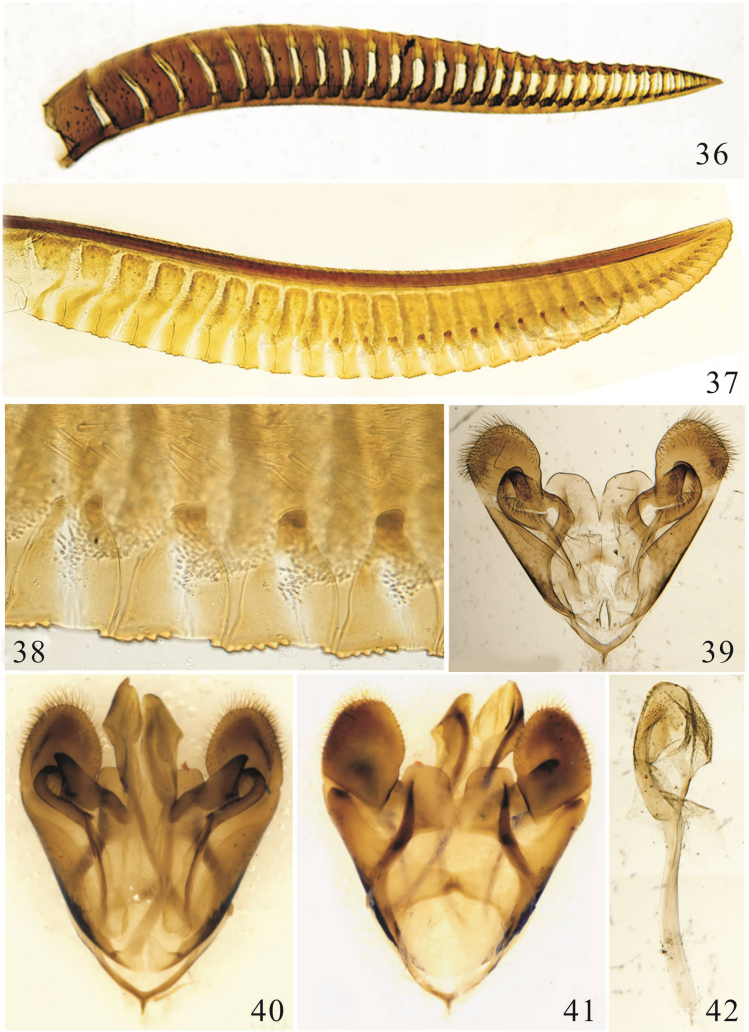
Dorsal of head nearly smooth, postocellar area shallowly punctured (Figs. 23, 24), postorbit finely and weakly punctured, labrum smooth, mandible coarsely punctured (Fig. 25), malar space indistinctly microsculptured. Pronotum smooth and indistinctly punctured, prescutum finely punctured, anterior slope of mesoscutellum smooth, posterior slope obscurely shallowly punctured, mesoscutellar appendage smooth with several shallow and large punctures, metascutellum smooth, elevated area of mesepisternum distinctly punctured, upper smooth, ventral distinctly and weakly punctured, mesepimeron and metapleuron largely smooth (Fig. 28), tergites weakly microsculptured, sternum indistinctly microsculptured, sheath distinctly and densely microsculptured.

Clypeus flat, anterior incision roundish and about 1/3 length of clypeus, labrum round and broad; malar space as long as diameter of ocellus; shortest distance between eyes 0.7 times as long as longest axis of eye (Fig. 22); supraantennal tubercles obtuse, evenly merging with frontal walls; postocellar area weakly elevated, 0.7 times as broad as long, lateral furrows slightly curved and distinctly divergent backwards; postocellar furrow shallow, interocellar furrow deep, OOL : POL : OCL = 7 : 21 : 16; occipital carina low but distinct; head slightly dilated in dorsal view, temple about 0.6 times as long as eye (Fig. 23); antenna slightly shorter than abdomen and vein C of fore wing, 3rd antennomere distinctly longer than 4th (55 : 38) (Fig. 26). Mesoscutellum roundly and strongly elevated, without transverse carina, with short

median carina (Fig. 27); mesoscutellar appendage with obtuse median ridge; middle of mesepisternum obtusely cone-shaped elevated, without ventral spur (Fig. 28). Vein cu-a of forewing meeting cell 1M at basal third, hind anal cell petiolate, petiole about 0.4 times as long as length of vein cu-a. Inner tibial spur of hind leg about 0.6 times as long as metabasitarsus, metabasitarsus about 0.85 times as long as following 3 tarsomeres together, tarsal pulvillus small; claw without basal lobe, inner tooth clearly shorter than outer tooth (Fig. 29). Ovipositor sheath as long as hind tibia, apical sheath 1.5 times as long as basal sheath (Fig. 32); lance as in Fig. 36; lancet with 30 flat serrulae (Fig. 37), middle serrulae each with 1 proximal and 3–5 distal subbasal teeth, 12th–14th serrulae as Fig. 38.

Figures 22–35. *Tenthredo biminutidota* Liu & Wei sp. nov. and *T. flavobrunneus* Malaise. 22–33. *T. biminutidota*; 34, 35. *T. flavobrunneus* Malaise, 1945; 22. Head of female, front view; 23, 34. Head of female, dorsal view; 24. Head of male, dorsal view; 25. Antenna of female; 26. Mandibles; 27. Mesoscutellum, lateral view; 28. Mesopleuron of female; 29. Claw; 30. Minute black dots on lateral of tergites; 31, 35. Hypopygium; 32. Ovipositor sheath, lateral view; 33. Male subgenital plate.

Male. Body length 13mm (Fig. 4); color similar to female except for hind tibia orange; structure similar to female except: eyes large, shortest distance between eyes below about 0.4 times as long as longest axis, malar space linear; head behind eyes very short and strongly narrowed in dorsal view (Fig. 24); mesepisternum weakly elevated; ventral sides of hind tibia and hind tarsus with long, dense and curved hairs, claw with inner tooth hardly shorter than outer tooth; subgenital plate much longer than broad, apical margin truncate (Fig. 33); harpe about as long as broad, apex round (Figs. 39–41); parapenis large and broad (Figs. 39, 41); penis valve as Fig. 42.



Figures 36–42. *Tenthredo biminutidota* Liu & Wei sp. nov. 36. Lance; 37. Lancet; 38. The 12th–14th serrulae; 39. Gonoforceps, dorsal view; 40. Male genitalia, dorsal view; 41. Male genitalia, ventral view; 42. Penis valve.

Variation. The body color varies a little in a few specimens. The black macula on dorsum of head may touch the eyes laterally. The upper part of hind orbit and prescutum may be black.

The length of the petiole of the hind anal cell varies from 0.2–0.4 times length of cu-a.

Holotype. ♀, **China,** Guizhou, Mt. Fanjingshan, Yangaoping, 27°55.9′ N, 108°44.5′ E, alt. 1750 m, 20–25-V-2008, Shuaiguo NIE. **Paratypes.** 2♀, Guizhou, Mt. Fanjingshan, Yangaoping, 27°55.9′ N, 108°44.5′ E, alt. 1750 m, 20–25-V-2008, Shuaiguo NIE; 6♀, Guizhou, Mt. Fanjingshan, Yangaoping, 27°55.9′ N, 108°44.5′ E, alt. 1750 m, 15–25-VI-2008, Shuaiguo NIE; 4♀5♂, Zhejiang, Lin'an, Qingliangfeng, Mt. Longtangshan, 30°07.04′ N, 118°52.41′ E, alt. 1380 m, 08-VI-2008, Meicai WEI, Gengyun NIU, Zejian LI, Li WEI & Ping HU; 4♀, Shaanxi, Foping County, Liangfengya, 33°41.117′ N, 107°51.250′ E, alt. 2128 m, 18-VI-2014, Liwei QI & Weinan KANG; 1♀, Hunan, Sangzhi, Mt. Badagongshan, 01-V-2000, Meicai WEI.

Etymology. The specific epithet refers to the minute dots on lateral of each tergite (Fig. 30).

Distribution. China (Zhejiang, Hunan, Guizhou, Shaanxi).

Remarks. This new species is quite similar to *Tenthredo flavobrunneus* Malaise, 1945, but differs from it in the postocellar area about 1.5 times as broad as long and the lateral furrows distinctly diverging backwards; the black macula on dorsum of head very large and almost touching eye or nearly so, the supraantennal tubercles largely black and evenly merging with frontal walls; the mesoscutellum and mesepisternum not strongly elevated with a low peak; each abdominal tergite with a narrow basal black band and a pair of black dots laterally; the female hypopygium with a large middle process and not shorter than lateral lobes, and serrulae hardly elevated. In *Tenthredo flavobrunneus* the postocellar area is about 1.14 times as broad as long, the lateral furrows weakly divergent backwards; the black macula on dorsum of head smaller and remote from eye, the supraantennal tubercles largely yellow white and with a shallow depression in front of frontal walls; the mesoscutellum and mesepisternum strongly elevated with a high peak; abdominal tergites 2–10 entirely orange brown and without any black macula; the female hypopygium with a smaller middle process and clearly shorter than lateral lobes, and serrulae distinctly elevated.

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